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### (54) A load carrier

(57) A load carrier is designed for mounting rearwardly on a vehicle and comprises a support arrangement with a lower (1) and an upper (2) support portion for cooperation with a lower (3) and an upper (4) portion, respectively, of the vehicle. The support portions (1, 2) are pivotally and adjustably interconnected with one another. The load carrier further has a carrier portion (7) which is intended for a load and which is pivotally adjustable in relation to the support portion, as well as anchorage devices for securing the load carrier on

the vehicle. Between the support arrangement and the carrier portion (7), there is disposed a connecting portion (6) whose one end region is, via a first lockable pivot (36), pivotally and lockably connected to the carrier portion (7), and whose other end region is connected to the support arrangement via a second lockable pivot (9) which also pivotally unites the two support portions (1, 2).

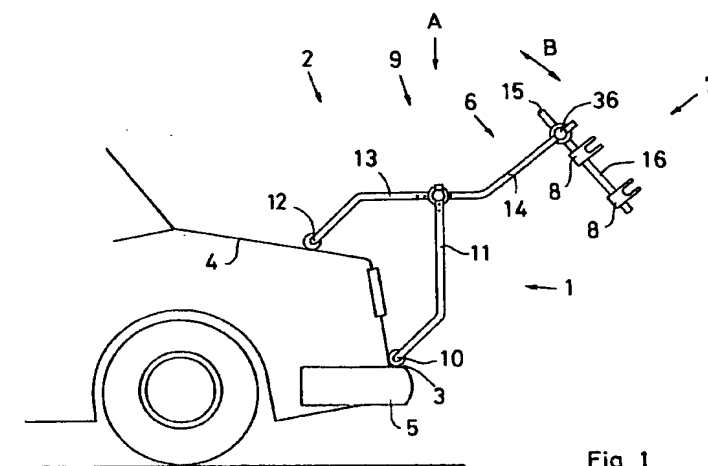


Fig 1

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## Description

### TECHNICAL FIELD

The present invention relates to a load carrier for mounting rearwardly on a vehicle and comprising:

a support arrangement for supporting the load carrier on the vehicle, the support arrangement having a lower support portion for cooperation with a lower portion of the vehicle, and an upper support portion for cooperation with a higher portion of the vehicle, the support portions being pivotally and adjustably interconnected with one another;

a carrier portion for carrying and retaining a load on the load carrier, the carrier portion being pivotally adjustable in relation to the support arrangement; and

anchorage devices for fixedly securing the load carrier on the vehicle.

### BACKGROUND ART

Load carriers of the above-outlined type are known in a plurality of different detailed designs. For example, reference may be made in this context to US 5 305 936 and US 4 518 108.

In the arrangement disclosed in US 5 305 936, use is made of two approximately U-shaped frames of which the one is substantially vertical and stands, with its lower, transversely directed portion, on the fender of the vehicle, while the other is approximately horizontal and rests with its forwardly directed transverse portion on the rear boot lid or hatch of the vehicle. The frames are pivotally connected to one another and the rearwardly directed, free legs of the approximately horizontal frame serve as carrier means for the load, preferably one or more cycles, which is to be carried.

A load carrier of this type is expedient such that it is capable of being collapsed to a substantially flat package.

Furthermore, on many occasions it can be as good as universally applicable as a result of its adjustment possibilities and by securement using clamping straps.

On the negative side is the fact that the cycle loaded on the load carrier hangs so low that it normally conceals both the rear lights and indicators of the vehicle, and also its registration plate. In addition, the load is located relatively far behind the vehicle and the vertical frame of the load carrier, with the result that stresses will be considerable.

The load carrier disclosed in US 4 518 108 is designed in a slightly different manner, in that it is partly located on the upper surface of the boot lid of the vehicle.

While, in this design and construction, the carrier

portion which is intended for carrying the load (preferably one or more cycles) is placed further forward and is located over the rear edge area of the boot lid, the load will still hang down so far that it conceals the rear lights and registration plate of the vehicle. As a result of the placing of the carrier portion, it is also difficult to lift up a load, since the load must be lifted over the rear end of the carrier portion which points obliquely upwards.

### PROBLEM STRUCTURE

The present invention has for its object to design the load carrier mentioned by way of introduction such that it carries the load, preferably the cycle or cycles, so highly that the load does not conceal the vehicle's rear registration plate and its rear lights. Furthermore, the present invention has for its object to realise a load carrier which is designed such that the parts carrying the load are switchable between a rear, lower loading position where the lifting height up to the load carrier is limited, and an upper, forward transport position where the load is located at a greater height and further forward in the direction of travel of the vehicle. The present invention also has for its object to realise a load carrier which is simple and economical in manufacture and in operation.

### SOLUTION

The objects forming the basis of the present invention will be attained if the load carrier intimated by way of introduction is characterized in that there is disposed, between the support arrangement and the carrier portion, a connecting portion whose one end region is connected to the carrier portion and whose opposing end region is, via a lockable pivot, connected to the support arrangement.

Further advantages will be attained according to the present invention if the subject matter of the present invention is also given one or more of the characterizing features as set forth in appended Claims 2 to 9.

### BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

The present invention will now be described in greater detail hereinbelow, with reference to the accompanying Drawings. In the accompanying Drawings:

- Fig. 1 shows the subject matter of the present invention mounted on a vehicle of the sedan type, and in the loading and unloading position;
- Fig. 2 shows the subject matter of the present invention mounted on a vehicle of the hatch-back type, and in the transport position;

Fig. 3 shows a pivot between the support portions and the connecting portion, seen in the direction of the arrow A in Fig. 1;

Fig. 4 shows an end plug included in the pivot of Fig. 3; and

Fig. 5 is a vertical section through the pivot according to Fig. 3 and in particular through its pivot shaft.

## DESCRIPTION OF PREFERRED EMBODIMENT

It will be apparent from Fig. 1 that the subject matter of the present invention includes a lower support portion 1 which, with a lower end portion, rests on a lower support surface 3 on the vehicle. The load carrier further includes an upper support portion 2 which, with a forward end portion, rests on a higher support surface 4 on the vehicle. The two support portions 1 and 2 together form a support arrangement.

The support arrangement 1 and 2 is securable on the vehicle by means of clamping straps (not shown), in which event in Fig. 1 at least one, but possibly two clamping straps connect the upper support portion 2 or the carrier portion 7 to the front edge of the boot lid, while at least one, but preferably two clamping straps connect the lower support portion 1 to the lower edge of the boot lid, or possibly to the bumper or fender 5 of the vehicle. In order to absorb load stresses in the lateral direction of the vehicle, there are further suitably included clamping straps which extend in the transverse direction of the vehicle, more or less horizontally, and which, for example, may grasp about the opposing side edges of the boot lid.

The support arrangement 1 and 2 is connected to a connecting portion 6 which, in its upper/rear end (i.e. the end which is turned to face away from the support arrangement), is connected to a carrier portion 7 with a bracket 8 for securing and supporting a load, preferably one or more cycles. The connecting portion 6 is connected to the support arrangement 1 and 2 by the intermediary of a pivot 9. As a result, the connecting portion 6 is pivotal in accordance with the double-headed arrow B from the loading and unloading position illustrated in Fig. 1 to a counterclockwise pivoted transport position where the carrier portion 7 is located at greater height and is pivoted to a forward position in the region above the boot lid 4 or its rear edge portion. The carrier portion 7 being pivoted upwards and forwards in this manner, the load will be lifted up so high that the rear lights and registration plate of the vehicle will not be concealed by the load. Furthermore, the load is pivoted forwards, and so, above all, the loading in those clamping straps which are hooked fast to the forward edge region of the boot lid is considerably reduced. At the same time, the compression loading is of course also reduced by the intermediary of the lower support portion 1.

Both the two support portions 1 and 2 and the connecting portion 6 and carrier portion 7 are designed as stirrups which are approximately U-shaped in plan view and in which the lower support portion 1 has a transverse portion 10 and two approximately parallel shanks 11 pointing in the same direction. Correspondingly, the upper support portion 2 has a transverse portion 12 and two substantially parallel shanks 13 pointing in the same direction. The connecting portion 6 also has a transverse portion 17 which is not shown in Figs. 1 and 2 since it is located between the parallel shanks of the upper support portion 2 (see however Fig. 3). On the other hand, the shanks 14 of the connecting portion 6 are clearly apparent from the Figure. Finally, the carrier portion 7 has a transverse portion 15 and two approximately parallel shanks 16 pointing in the same direction.

The pivot 9 includes two mirror-reversed joints in which the left-hand joint, i.e. that which is visible in Figs. 1 and 2, is shown in Fig. 3 according to the arrow A in Fig. 1. It will be apparent that the lower support portion 1 and the upper support portion 2 are united in the pivot at the free ends of their shanks 11 and 13, respectively. It will further be apparent that the connecting portion 6 cooperates with the pivot 9 in the proximity of its transverse portion 17.

The pivot 9 includes a first pivot joint which permits mutual pivoting between the lower support portion 1 and the upper support portion 2. This pivot joint has an operating device 18 for its switching between a position where the support portions are fixedly locked in relation to one another, and an open position where the support portions are pivotal in relation to one another. The pivot 9 also includes a second pivot joint between the support arrangement 1 and 2 and the connecting portion 6. This pivot joint also has its own operating device 19 which permits the second pivot joint independently of the first to be switched between a locked position where the connecting portion 6 is fixedly locked in relation to the support arrangement 1 and 2, and an open position where the connecting portion may be pivoted in accordance with the arrow B in Fig. 1. Both of the pivot joints have a common pivot shaft 20.

The pivot 9 includes two spacers 21 and 22 which are preferably of identical design. On its outside (in Fig. 3 the left-hand side, and in Fig. 1 the side of the Figure facing towards the reader), the outer spacer 21 has a groove 23 with a semicylindrical bottom, in which the one shank 11 of the lower support portion 1 is largely accommodated. On its inside, the outer spacer has two intersecting recesses 24 and 25 which also have approximately semicylindrical cross sectional configuration. Correspondingly, the inner spacer (the right-hand in Fig. 3) has, on its outside (the left-hand), two intersecting recesses 26 and 27 and, on its inside, a recess 28 corresponding to the recess or groove 23 on the outside of the outer spacer.

For the pivot 9 to be able to permit pivoting and locking of the two support portions 1 and 2 in relation to

one another, the shaft 20 is, in practice, designed as a threaded bar which has a stop or arrest member inter-  
iorly in the shank 13 of the upper support 2. Hereby, the  
threaded shaft is fixed in its axial direction in relation to  
the upper support portion. The operating device 18 is  
designed as a threaded wheel and may thus be  
screwed along the threaded shaft. As a result of the  
arrest member on the threaded shaft, a possibility is  
created, by backing-off the wheel 18, to pivot the two  
support portions 1 and 2 in relation to one another, pre-  
ferably in that the shank 13 is disengaged from the  
recess 24.

In a corresponding manner, the inner operating  
device 19 is designed as a threaded wheel which may  
be screwed along the threaded shaft 20. By backing-off  
the wheel 19, it is possible to realise pivoting of the  
connecting portion 6 in that its shanks are forced or pressed  
out of the recess 28 so that they are free for a pivoting  
motion, or in that the spacer 22 is displaced to the right  
in Fig. 3 so far that the shank 13 is freely disengaged  
from the recess 26.

Fig. 4 shows in perspective an end plug 29 which  
extends in to the shank 13 of the upper support portion  
2 at least up to and slightly past the pivot shaft 20. That  
nut 30 which provides the axial locking of the shaft 20 in  
relation to the shank 13 is shown in Fig. 5 and is locked  
in its direction of rotation and in the longitudinal direction  
of the threaded shaft 20 by cooperation with the end  
plug 29. For this reason, the end plug has two elongate  
prongs 31 and 32 which, on their sides facing towards  
one another, have longitudinal grooves 33 and 34,  
respectively, in which the nut 30 is accommodated. The  
side edges of the grooves abut against the flank sur-  
faces of the nut 30 and hereby fix the nut in the longitu-  
dinal direction of the shaft. The grooves 33 and 34 are  
further provided with recesses 35 which prevent the nut  
30 from rotating in relation to the end plug 29. The  
recesses 35 may possibly be dispensed with, whereby it  
becomes possible first to assemble the threaded shaft  
or bar 20 and the nut 30 and thereafter slide in the end  
plug 29 so that the nut enters into its grooves 33 and 34  
and is thereby prevented from rotating.

In Fig. 3, the grooves 23 - 28 are disposed either in  
parallel or at right angles. This implies that the two sup-  
port portions 1 and 2 may be pivoted in relation to one  
another stepwise through approximately 90°. Corre-  
spondingly, the connecting portion 6 may be pivoted  
stepwise through approximately 90° in relation to and  
independently of the two support portions 1 and 2. It  
is thus possible to find pivot positions where the support  
portions 1 and 2 and the connecting portion lie substan-  
tially in one and the same plane. In this position, the  
subject matter of the present invention is in the col-  
lapsed state for transport.

Correspondingly, the carrier portion 7 is connected  
to the connecting portion 6 by the intermediary of pivots  
36 which permit stepwise pivotal adjustment between  
these parts. Suitably, the pivot step is approximately 90°

here as well. By pivoting the carrier portion 7 through  
90° in a clockwise direction, the carrier portion will be  
pivoted in between both shanks 14 of the connecting  
portion 6, for which reason the carrier portion 7 may  
also be pivoted to a position where it lies in a plane  
which is substantially common to the plane of both of  
the support portions, the connecting portion and the  
carrier portion.

Fig. 2 shows the subject matter of the present  
invention disposed on a vehicle of the hatchback or  
combi type. Further, in Fig. 2 the connecting portion 6  
and the carrier portion 7 are in the transport position. As  
regards the support arrangement 1 and 2, the only dif-  
ference compared with Fig. 1 is that the upper support  
portion 2 is turned to face with its transverse portion 12  
forwards/ upwards instead of, as in Fig. 1, forwards/  
downwards. Such a modification of the orientation of the  
upper support portion 2 is readily achieved by dismant-  
ling the pivot 9.

As an alternative to the pivot 9, it is possible to sep-  
arate the pivot function between the two support por-  
tions 1 and 2 and from the pivot function between  
support arrangement and the connecting portion 6.

## Claims

1. A load carrier for mounting rearwardly on a vehicle  
and comprising:

a support arrangement for supporting the load  
carrier on the vehicle, the support arrangement  
having a lower support portion (1) for coopera-  
tion with a lower portion (3) of the vehicle, and  
an upper support portion (2) for cooperation  
with a higher portion (4) of the vehicle, said  
support portions (1, 2) being pivotally and  
adjustably interconnected with one another;

a carrier portion (7) for carrying and retaining a  
load on the load carrier, the carrier portion  
being pivotally adjustable in relation to the sup-  
port arrangement; and

anchorage devices for fixedly securing the load  
carrier on the vehicle,

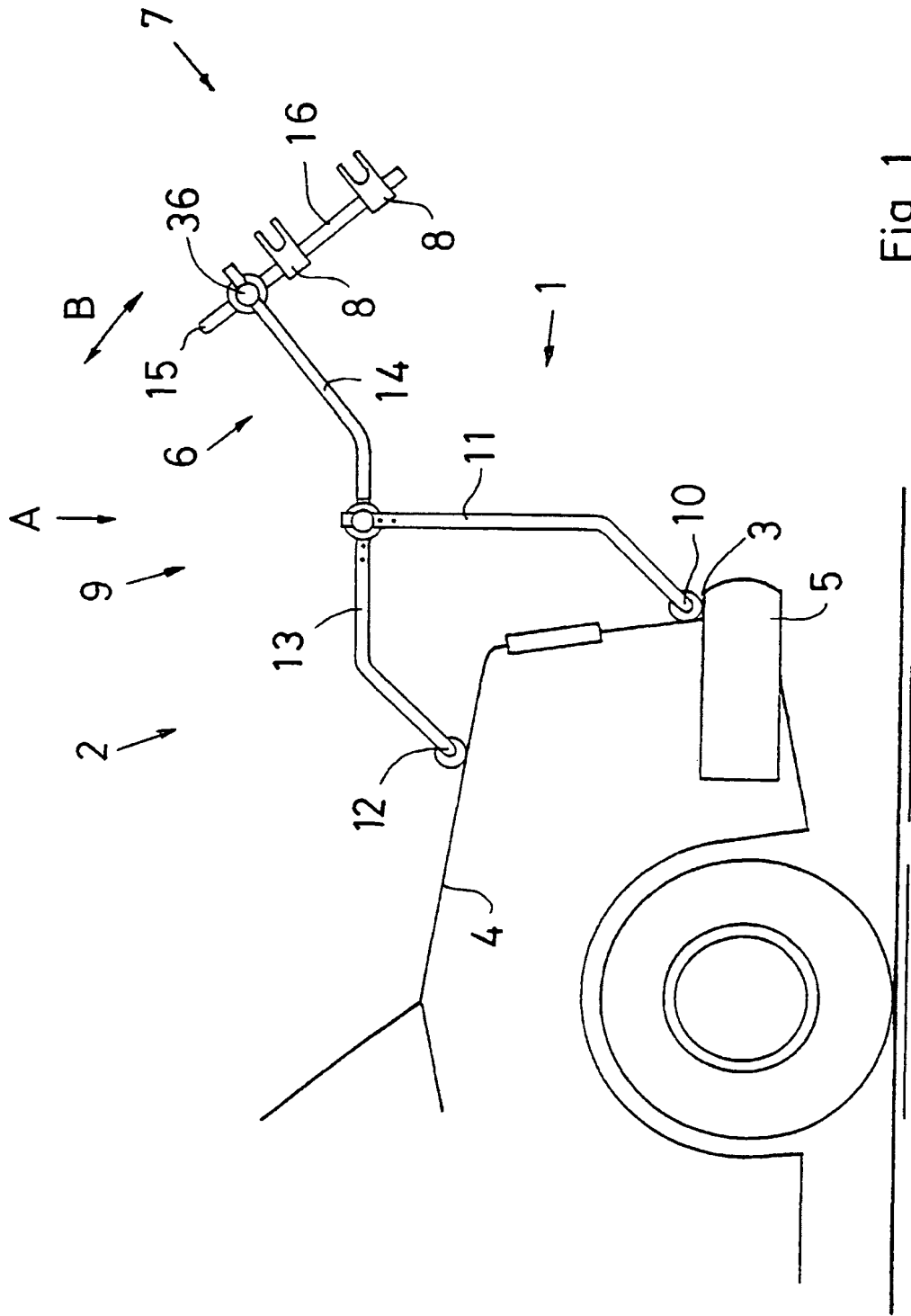
**characterized in that** there is disposed,  
between the support arrangement and the car-  
rier portion (7), a connecting portion (6) whose  
one end region is connected to the carrier por-  
tion (7) and whose opposing end region is, via  
a lockable pivot (9), connected to the support  
arrangement.

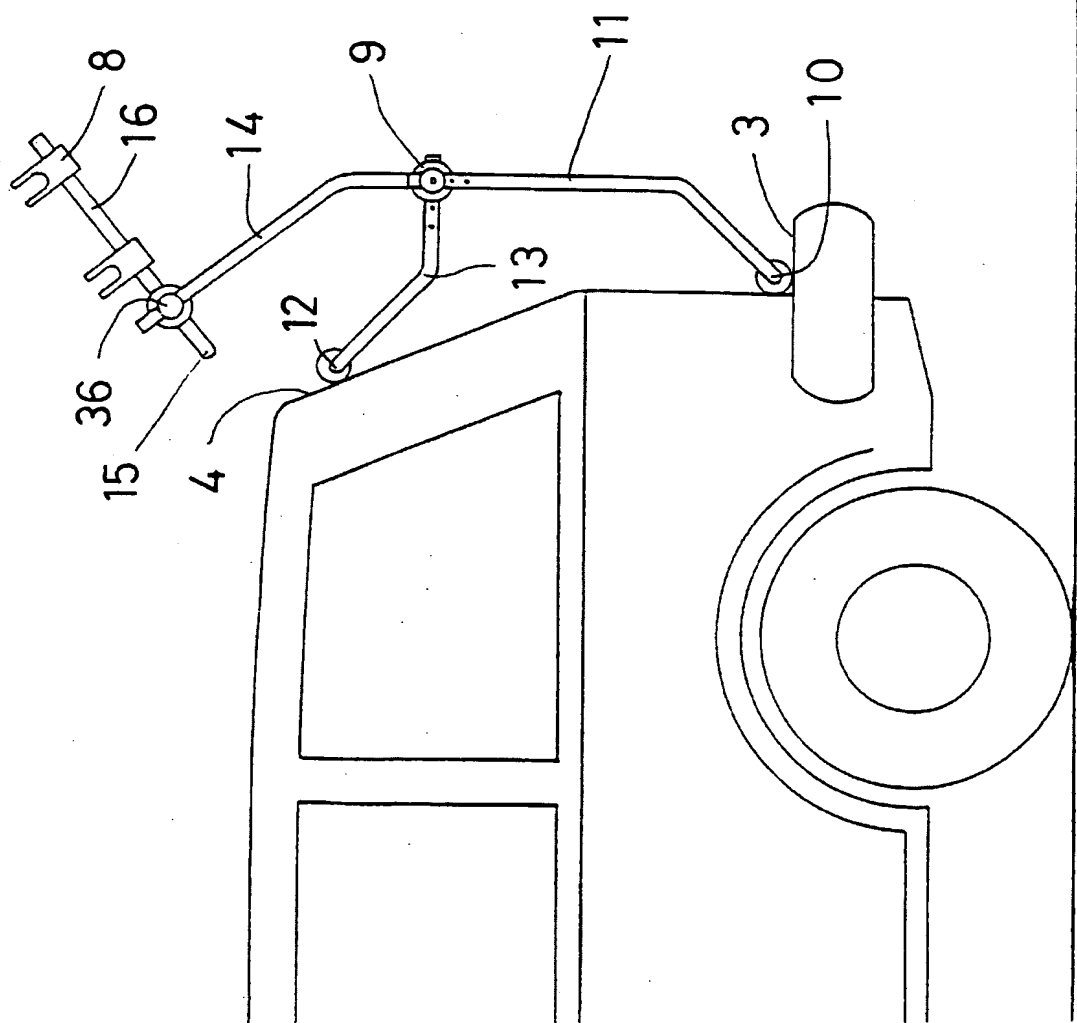
2. The load carrier as claimed in Claim 1, **character-  
ized in that** the support portions (1, 2) are united  
by the intermediary of at least one lockable pivot (9)  
which, in the position of use of the load carrier on a  
vehicle, has one substantially horizontal pivot shaft

(20) transversely directed in relation to the longitudinal direction of the vehicle.

3. The load carrier as claimed in Claim 1 or 2, **characterized in that** the pivot (9) connecting the connecting portion (6) with the support portion has a pivot shaft which is common to the pivot shaft of the pivot (9) connecting the support portions (1, 2). 5
4. The load carrier as claimed in any of Claims 1 to 3, **characterized in that** the connecting portion (6) and the carrier portion (7) are connected by the intermediary of at least one lockable pivot (36). 10
5. The load carrier as claimed in any of Claims 1 to 4, **characterized in that** the pivot shafts of all pivots (9, 36) are substantially horizontal and parallel. 15
6. The load carrier as claimed in any of Claims 1 to 5, **characterized in that** the two support portions (1, 2), the connecting portion (6) and the carrier portion (7) each have a transverse portion (10, 12, 17, 15, respectively), from whose opposing end regions a shank (11, 13, 14, 16, respectively) extends out substantially at right angles to that transverse portion, the shanks on the same transverse portion extending in the same direction and being substantially parallel. 20 25
7. The load carrier as claimed in Claim 6, **characterized in that** the pivot (36) between the carrier portion (7) and the connecting portion (6) is located in the region of the free ends of the shanks (14) of the connecting portion and the transverse portion (15) of the carrier portion. 30 35
8. The load carrier as claimed in Claim 6 or 7, **characterized in that** the pivot (9) between the support arrangement and the connecting portion (6) is disposed in the region of the transverse portion (17) of the connecting portion and in the regions of the free ends of the shanks (11, 13, respectively) of the support portions (1, 2). 40
9. The load carrier as claimed in any of Claims 1 to 8, **characterized in that** the pivot (9) for connecting the support arrangement and the connecting portion (6) has a first (18) and a second (19) operating device, said first operating device (18) being provided for the mutual rotation and locking of the support portions (1, 2), while the second operating device (19) is provided for the rotation and locking of the connecting portion (6) in relation to the support arrangement. 45 50

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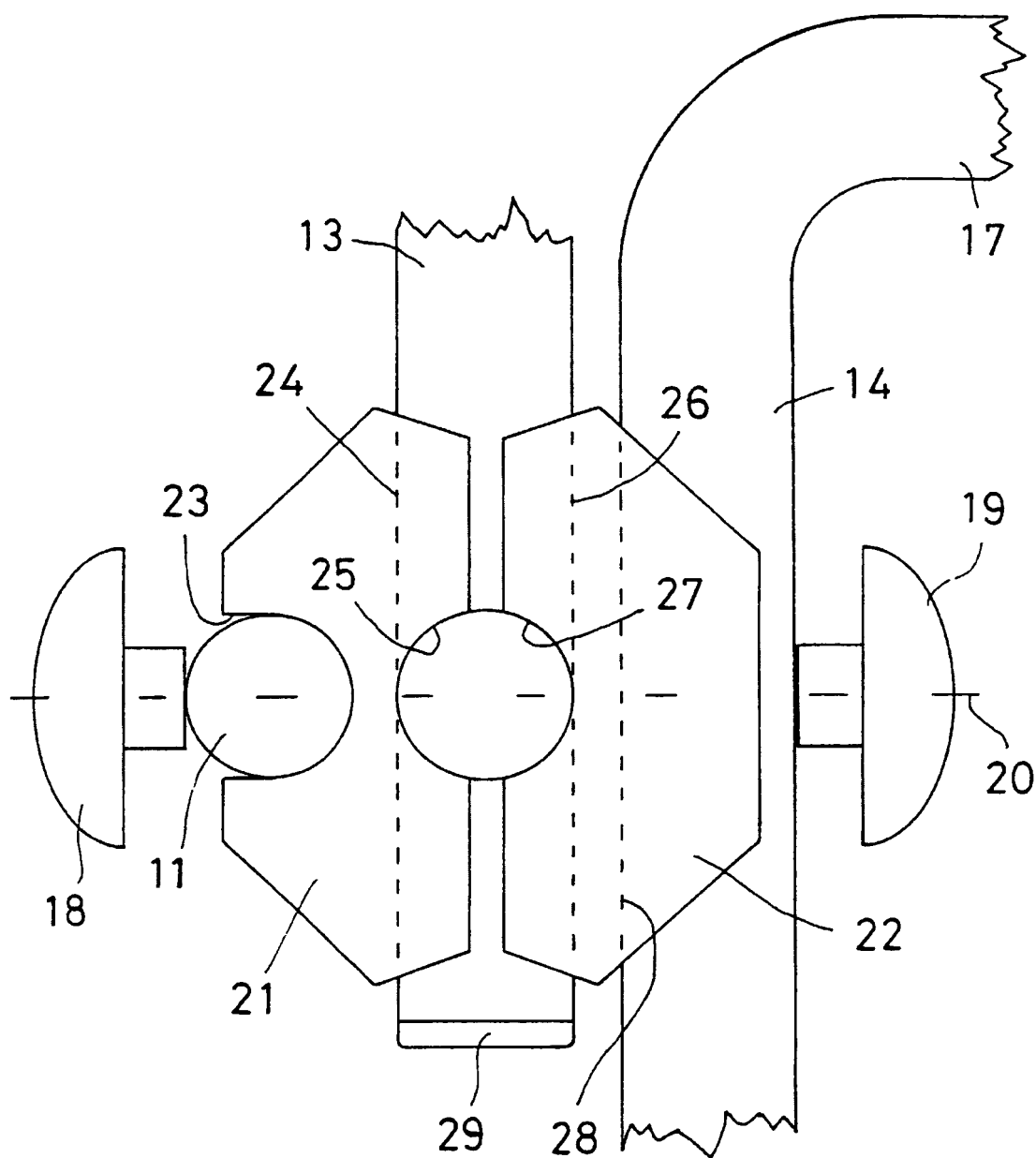


Fig 3



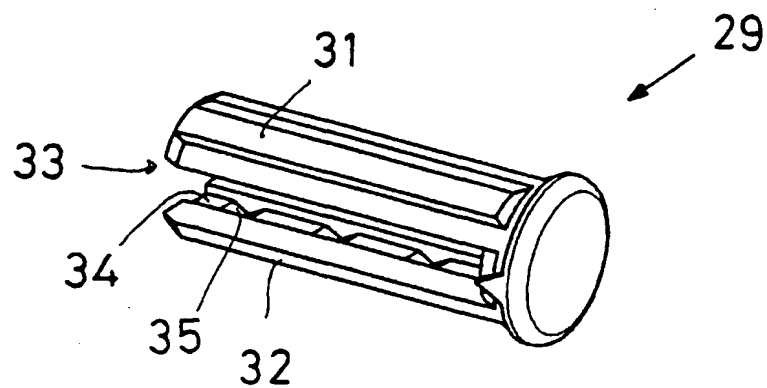


Fig 4

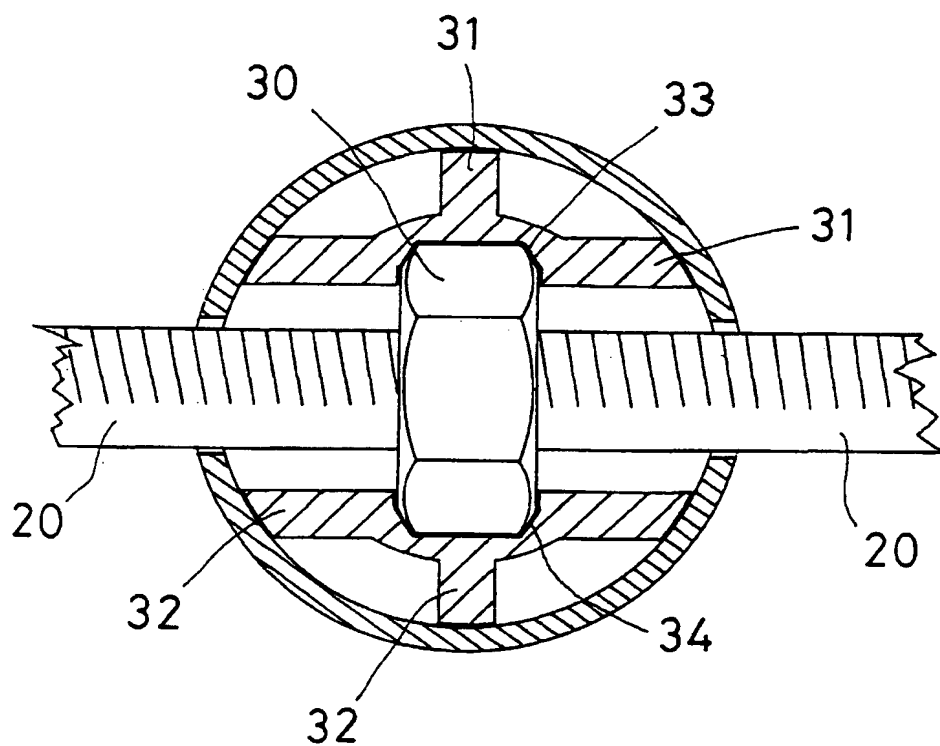


Fig 5

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